CLAIMS

What is claimed is:

1. A serviceable exhaust aftertreatment device for diesel exhaust flowing axially along an axial flowpath from upstream to downstream, comprising an inlet cylindrical body providing an inlet section, a central cylindrical body providing an exhaust aftertreatment central section, and an outlet cylindrical body providing an outlet section, said cylindrical bodies being axially colinearly aligned along said axis, with said central cylindrical body axially between said inlet and outlet cylindrical bodies and removable therefrom for servicing, each of said cylindrical bodies having a main body outer profile of given outer diameter, said inlet cylindrical body mating with said central cylindrical body at a first junction, said central cylindrical body mating with said outlet cylindrical body at a second junction, each of said junctions having an outer profile of increased outer diameter, the increase in outer diameter from said given outer diameter being less than 2%.

2. The exhaust aftertreatment device according to claim 1 wherein said increase in outer diameter is in the range of 1 to 2%.

3. The exhaust aftertreatment device according to claim 2 wherein said given outer diameter is in the range of 7 to 13 inches, and said increase in outer diameter is approximately 0.125 inch.

4. A serviceable exhaust aftertreatment device for exhaust flowing axially along an axial flowpath from upstream to downstream, comprising an inlet cylindrical body providing an inlet section, a central cylindrical body providing an exhaust aftertreatment central section, and an outlet cylindrical body providing an outlet section, said cylindrical bodies being axially colinearly aligned along said axis, with said central cylindrical body axially between said inlet and outlet cylindrical bodies and removable therefrom for servicing, said inlet and outlet

cylindrical bodies being mated and sealed to each other without a gasket therebetween, said central and outlet cylindrical bodies being mated and sealed to each other without a gasket therebetween.

5. The exhaust aftertreatment device according to claim 4 wherein said inlet and central cylindrical bodies are mated and sealed to each other along an axially extending first annulus, and said central and outlet cylindrical bodies are mated and sealed to each other along a second axially extending annulus.

6. The exhaust aftertreatment device according to claim 5 wherein said inlet and central cylindrical bodies have first and second structurally rigidizing beads, respectively, at axially distally opposite upstream and downstream ends of said first annulus, and wherein said central and outlet cylindrical bodies have third and fourth structurally rigidizing beads, respectively, at axially distally opposite upstream and downstream ends of said second annulus.

7. A serviceable exhaust aftertreatment device for exhaust flowing axially along an axial flowpath from upstream to downstream, comprising an inlet cylindrical body providing an inlet section, a central cylindrical body providing an exhaust aftertreatment central section, and an outlet cylindrical body providing an outlet section, said cylindrical bodies being axially colinearly aligned along said axis, with said central cylindrical body axially between said inlet and outlet cylindrical bodies and removable therefrom for servicing, said inlet and central cylindrical bodies being mated to each other along a first axially extending annulus, said central and outlet cylindrical bodies being mated to each other along a second axially extending annulus, said inlet and central cylindrical bodies having first and second raised annular ribs providing first and second structurally rigidizing beads, respectively, said first and second beads being axially nonoverlapped and axially spaced by said first annulus therebetween, said central and outlet cylindrical

bodies having third and fourth raised annular ribs providing third and fourth structurally rigidizing beads, respectively, said third and fourth beads being axially nonoverlapped and axially spaced by said second annulus therebetween.

8. A serviceable exhaust aftertreatment device for exhaust flowing axially along an axial flowpath from upstream to downstream, comprising an inlet cylindrical body providing an inlet section, a central cylindrical body providing an exhaust aftertreatment central section and an outlet cylindrical body providing an outlet section, said cylindrical bodies being axially colinearly aligned along said axis, with said central cylindrical body being axially between said inlet and outlet cylindrical bodies and removable therefrom for servicing, said inlet cylindrical body having distally opposite upstream and downstream axial ends, said central cylindrical body having distally opposite upstream and downstream axial ends, said outlet cylindrical body having distally opposite upstream and downstream axial ends, said downstream end of said inlet cylindrical body engaging said upstream end of said central cylindrical body in axial sliding telescoped relation, said downstream end of said central cylindrical body engaging said upstream end of said outlet cylindrical body in axial sliding telescoped relation, such that said exhaust aftertreatment device is serviced by axially sliding said inlet and central cylindrical bodies away from each other and axially sliding said central and outlet cylindrical bodies away from each other.

9. The exhaust aftertreatment device according to claim 8 wherein said downstream end of said inlet cylindrical body has a beaded construction comprising a first raised annular rib of increased radial height and a first annular flange extending axially downstream therefrom, said upstream end of said central cylindrical body has a beaded construction comprising a second raised annular rib of increased radial height and a second annular flange extending axially upstream therefrom, said downstream end of said central cylindrical body has a

beaded construction comprising a third raised annular rib of increased radial height and a third annular flange extending axially downstream therefrom, said upstream end of said outlet cylindrical body has a beaded construction comprising a fourth raised annular rib of increased radial height and a fourth annular flange extending axially upstream therefrom, wherein said first and second annular flanges engage in axial sliding telescoped relation without axial overlap of said first and second raised annular ribs, and said third and fourth annular flanges engage in axial sliding telescoped relation without axial overlap of said third and fourth annular ribs, whereby to permit servicing of said exhaust aftertreatment device by axial withdrawal and insertion of said cylindrical bodies.

10. The exhaust aftertreatment device according to claim 9 wherein said inlet cylindrical body has an axially extending sidewall having a double shoulder construction comprising a first raised shoulder of first increased radial height and a second raised shoulder of second increased radial height, said second raised shoulder providing said first raised annular rib, said second increased radial height being greater than said first increased radial height, said central cylindrical body has an axially extending sidewall having a double shoulder construction at said upstream end comprising a third raised shoulder of third increased radial height and a fourth raised shoulder of fourth increased radial height, said fourth raised shoulder providing said second raised annular rib, said fourth increased radial height being greater than said third increased radial height, said sidewall of said second cylindrical body having another double shoulder construction at said downstream end comprising a fifth raised shoulder of fifth increased radial height and a sixth raised shoulder of sixth increased radial height, said sixth raised shoulder providing said third raised annular rib, said sixth increased radial height being greater than said fifth increased radial height, said outlet cylindrical body has an axially extending sidewall having a double shoulder construction comprising a seventh raised shoulder of seventh increased radial height

and an eighth raised shoulder of eighth increased radial height, said eighth raised shoulder providing said fourth raised annular rib, said eighth increased radial height being greater than said seventh increased radial height.

11. The exhaust aftertreatment device according to claim 10 wherein said inlet cylindrical body sidewall has inner and outer surfaces, said outer surface of said inlet cylindrical body sidewall at said first flange has a radial height less than the radial height of said outer surface of said inlet cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said outer surface of said inlet cylindrical body sidewall at said first shoulder, said central cylindrical body sidewall has inner and outer surfaces, said outer surface of said central cylindrical body sidewall at said second flange has a radial height less than the radial height of said outer surface of said central cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said outer surface of said central cylindrical body sidewall at said third shoulder, said outer surface of said central cylindrical body sidewall at said third flange has a radial height less than the radial height of said outer surface of said central cylindrical body sidewall at said sixth shoulder and less than or equal to the radial height of said outer surface of said central cylindrical body sidewall at said fifth shoulder, said outlet cylindrical body sidewall has inner and outer surfaces, said outer surface of said outlet cylindrical body sidewall at said fourth flange has a radial height less than the radial height of said outer surface of said outlet cylindrical body sidewall at said eighth shoulder and less than or equal to the radial height of the outer surface of said outlet cylindrical body sidewall at said seventh shoulder.

12. The exhaust aftertreatment device according to claim 10 wherein said inlet cylindrical body sidewall has inner and outer surfaces, said inner surface of said inlet cylindrical body sidewall at said first flange has a radial height less than the radial height of said inner surface of said inlet cylindrical body

sidewall at said second shoulder and less than or equal to the radial height of said inner surface of said inlet cylindrical body sidewall at said first shoulder, said central cylindrical body sidewall has inner and outer surfaces, said inner surface of said central cylindrical body sidewall at said second flange has a radial height less than the radial height of said inner surface of said central cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said inner surface of said central cylindrical body sidewall at said third shoulder, said inner surface of said central cylindrical body sidewall at said third flange has a radial height less than the radial height of said inner surface of said central cylindrical body sidewall at said sixth shoulder and less than or equal to the radial height of said inner surface of said central cylindrical body sidewall at said fifth shoulder, said outlet cylindrical body sidewall has inner and outer surfaces, said inner surface of said outlet cylindrical body sidewall at said fourth flange has a radial height less than the radial height of said inner surface of said outlet cylindrical body sidewall at said eighth shoulder and less than or equal to the radial height of said inner surface of said outlet cylindrical body sidewall at said seventh shoulder.

13. The exhaust aftertreatment device according to claim 10 wherein said first, third, fifth and seventh increased radial heights are substantially equal to each other, and wherein said second, fourth, sixth and eighth increased radial heights are substantially equal to each other.

14. The exhaust aftertreatment device according to claim 10 wherein said inlet cylindrical body sidewall has inner and outer surfaces, said outer surface of said inlet cylindrical body sidewall at said first flange has a radial height less than the radial height of said outer surface of said inlet cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said outer surface of said inlet cylindrical body sidewall at said first shoulder, said central cylindrical body sidewall has inner and outer surfaces, said outer surface of

said central cylindrical body sidewall at said second flange has a radial height less than the radial height of said outer surface of said central cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said outer surface of said central cylindrical body sidewall at said third shoulder, said outer surface of said central cylindrical body sidewall at said third flange has a radial height less than the radial height of said outer surface of said central cylindrical body sidewall at said sixth shoulder and less than or equal to the radial height of said outer surface of said central cylindrical body sidewall at said fifth shoulder, said outlet cylindrical body sidewall has inner and outer surfaces, said outer surface of said outlet cylindrical body sidewall at said fourth flange has a radial height less than the radial height of said outer surface of said outlet cylindrical body sidewall at said eighth shoulder and less than or equal to the radial height of the outer surface of said outlet cylindrical body sidewall at said seventh shoulder, said inner surface of said inlet cylindrical body sidewall at said first flange has a radial height less than the radial height of said inner surface of said inlet cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said inner surface of said inlet cylindrical body sidewall at said first shoulder, said inner surface of said central cylindrical body sidewall at said second flange has a radial height less than the radial height of said inner surface of said central cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said inner surface of said central cylindrical body sidewall at said third shoulder, said inner surface of said central cylindrical body sidewall at said third flange has a radial height less than the radial height of said inner surface of said central cylindrical body sidewall at said sixth shoulder and less than or equal to the radial height of said inner surface of said outlet cylindrical body sidewall at said fifth shoulder, said inner surface of said outlet cylindrical body sidewall at said fourth flange has a radial height less than the radial height of said inner surface of said outlet cylindrical body sidewall at said eighth shoulder and less than or equal to the radial height of said inner surface of said outlet cylindrical body sidewall at said seventh

shoulder, the radial height of said outer surface of said sidewall of one of said first and second flanges is substantially equal to the radial height of said inner surface of said sidewall of the other of said first and second flanges, the radial height of said outer surface of said sidewall of one of said third and fourth flanges is substantially equal to the radial height of said inner surface of said sidewall of the other of said third and fourth flanges.

15. The exhaust aftertreatment device according to claim 10 wherein said central section comprises a plurality of cylindrical bodies.

16. A method for servicing exhaust aftertreatment device for exhaust flowing axially along an axial flowpath from upstream to downstream, said exhaust aftertreatment device having an inlet cylindrical body providing an inlet section, a central cylindrical body providing an exhaust aftertreatment central section, and an outlet cylindrical body providing an outlet section, said cylindrical bodies being axially colinearly aligned along said axis, said central cylindrical body being axially between said inlet and outlet cylindrical bodies, said method comprising axially moving said inlet and central cylindrical bodies away from each other and axially moving said central and outlet cylindrical bodies away from each other and removing said central cylindrical body, and installing a replacement central cylindrical body by axially moving said inlet cylindrical body and said replacement central cylindrical body axially towards each other and into engagement with each other in axial sliding overlapped telescoped relation, and moving said replacement central cylindrical body and said outlet cylindrical body axially towards each other and into engagement with each other in axial sliding overlapped telescoped relation.

17. The method according to claim 16 comprising structurally rigidizing said cylindrical bodies with respective raised ribbed annular beads, and

comprising axially sliding said inlet cylindrical body and said replacement central cylindrical body into engagement with each other without overlap of said annular beads of said inlet cylindrical body and said replacement central cylindrical body, and axially sliding said replacement central cylindrical body and said outlet cylindrical body into engagement with each other without overlap of said annular beads of said replacement central cylindrical body and said outlet cylindrical body, such that upon the next servicing of said exhaust aftertreatment device, said inlet and central cylindrical bodies may be moved axially away from each other without axial detent interference by said annular beads of said inlet and central cylindrical bodies, and such that said central and outlet cylindrical bodies may be axially moved away from each other without axial detent interference by said annular beads of said central and outlet cylindrical bodies.

18. Cylindrical bodies configured for coupling, comprising first and second cylindrical bodies axially colinearly aligned along an axis and engaging each other in axial sliding telescoped relation, said first cylindrical body having a beaded construction comprising a first raised annular rib of increased radial height and a first annular flange extending axially therefrom, said second cylindrical body having a beaded construction comprising a second raised annular rib of increased radial height and a second annular flange extending axially therefrom, said first and second annular flanges engaging in axial sliding telescoped relation without axial overlap of said first and second raised annular ribs, said first cylindrical body having an axially extending sidewall having a double shoulder construction comprising a first raised shoulder of first increased radial height and a second raised shoulder of second increased radial height, said second raised shoulder providing said first raised annular rib, said second increased radial height being greater than said first increased radial height, said second cylindrical body having an axially extending sidewall having a double shoulder construction comprising a third raised shoulder of third increased radial height and a fourth raised shoulder of fourth

increased radial height, said fourth raised shoulder providing said second raised annular rib, said fourth increased radial height being greater than said third increased radial height.

19. The cylindrical bodies according to claim 18 wherein said first cylindrical body sidewall has inner and outer surfaces, said outer surface of said first cylindrical body sidewall at said first flange has a radial height less than the radial height of said outer surface of said first cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said outer surface of said first cylindrical body sidewall at said first shoulder, said second cylindrical body sidewall has inner and outer surfaces, said outer surface of said second cylindrical body sidewall at said second flange has a radial height less than the radial height of said outer surface of said second cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said outer surface of said second cylindrical body sidewall at said third shoulder.

20. The cylindrical bodies according to claim 18 wherein said first cylindrical body sidewall has inner and outer surfaces, said inner surface of said first cylindrical body sidewall at said first flange has a radial height less than the radial height of said inner surface of said first cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said inner surface of said first cylindrical body sidewall at said first shoulder, said second cylindrical body sidewall has inner and outer surfaces, said inner surface of said second cylindrical body sidewall at said second flange has a radial height less than the radial height of said inner surface of said second cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said inner surface of said second cylindrical body sidewall at said third shoulder.

21. The cylindrical bodies according to claim 18 wherein said first

and third increased radial heights are substantially equal to each other, and said second and fourth increased radial heights are substantially equal to each other.

22. The cylindrical bodies according to claim 18 wherein said first cylindrical body sidewall has inner and outer surfaces, said outer surface of said first cylindrical body sidewall at said first flange has a radial height less than the radial height of said outer surface of said first cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said outer surface of said first cylindrical body sidewall at said first shoulder, said second cylindrical body sidewall has inner and outer surfaces, said outer surface of said second cylindrical body sidewall at said second flange has a radial height less than the radial height of said outer surface of said second cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said outer surface of said second cylindrical body sidewall at said third shoulder, said inner surface of said first cylindrical body sidewall at said first flange has a radial height less than the radial height of said inner surface of said first cylindrical body sidewall at said second shoulder and less than or equal to the radial height of said inner surface of said first cylindrical body sidewall at said first shoulder, said inner surface of said second cylindrical body sidewall at said second flange has a radial height less than the radial height of said inner surface of said second cylindrical body sidewall at said fourth shoulder and less than or equal to the radial height of said inner surface of said second cylindrical body sidewall at said third shoulder, wherein the radial height of said outer surface of said sidewall of one of said first and second flanges is substantially equal to the radial height of the inner surface of said sidewall of the other of said first and second flanges.